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CURRENT LITERATURE

BOOK REVIEWS

The nature and development of plants

Dr. CURTIS[1] offers a new book with this title on a basis which must be regarded by anyone attempting to judge its merits. It is not intended as a textbook, says the author, but to give a point of view and to stimulate inquiry. A student who is thoroughly acquainted with *Principles of botany* by BERGEN and DAVIS would discover by examination of this text, as well as by reading the preface, that the book is intended for one of more limited secondary training. That the majority of college freshmen have in one way or another escaped or evaded adequate secondary training makes this effort by Dr. CURTIS very acceptable and practical. The author has used excellent judgment in the selection of material both for discussion and for illustration. So far as possible, plants which the student is likely to see or hear about are used. In order to awaken interest a narrative rather than an expositional style prevails, and the economic significance of several important features of plant life are emphasized in attractive connections. Associated with this style and plan there is apparent an effort to stimulate originality and independent reasoning.

The book is structurally simple, being without even a complete table of contents, but perfectly clear in plan and purpose. The introduction develops a conception of the cell as the unit of structure and of protoplasm as the physical basis of vital phenomena. Part I presents the outer and inner morphology of roots, stems, leaves, etc.; while Part II traces the phylogeny of the four great groups according to the older ENGLER and PRANTL classification. One is at once impressed with the unusual excellence of the illustrations of which there are over three hundred, in most cases original.

If one searches for defects, and this a critic is supposed to do, instances of faulty composition and inaccurate statement may be found. "The elements that compose any substances are held together with great energy owing to their mutual attraction for one another," is an unfortunate slip which disregards the numerous unstable compounds. "The transmission of hereditary characters may be stated as follows. Every feature of a plant or animal which we recognize in distinguishing them is due to hereditary substances derived from the parents." To what extent such a general statement is true cannot be said off-hand, though there is experimental evidence, not overlooked in the text, which renders such a generalization invalid. "The work of respiration is carried on more economically by green plants than by animals, since in the animal the CO_2 escapes in the breath as a waste product, while the plant uses the CO_2 during day time for the construction of foods." There is regrettable confusion here, involving comparison of incomparable processes. Carbon dioxide happens to be a waste product in animal metabolism, but in addition to this in the case of green plants it is also food material. The contrasting of the work of respiration in the two cases upon this basis is wrong, as the author well knows. As a matter of fact, we have no reason to believe that the work of respiration as done by plant protoplasm is more economical than that done by animal protoplasm.

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[1] CURTIS, CARLTON C., Nature [and development of plants. 8vo. pp. 471. *figs. 342.* New York: Henry Holt & Co. 1907. $2.50.

That this book successfully meets the demand intended to be supplied by the author is certain, and this is abundant justification for anyone who has the courage to run the gauntlet with a new book.—RAYMOND H. POND.

Evolution in the potato beetles

Although the work of Professor TOWER[2] on Leptinotarsa deals with a group of animals, his book should not be overlooked by botanists on that account. Probably no work since the appearance of DEVRIES' *Mutationstheorie* is more worthy of careful study. The contribution is essentially along experimental lines, backed by years of observation in the field and laboratory. Many of the problems, if not solved, are seen in clearer light, and at least some of the mooted questions may now be dismissed as answered. Every chapter is of interest to all schools of biologists, but there is space here merely for a few of the more important conclusions. The introductory chapter on geographical distribution and dispersion is followed by chapters on variation, coloration, habits, and instincts. Of intense interest are the final chapters, entitled "Production in experiment of races, new characters, and species in Leptinotarsa," and "The problem of the origin of species." The author believes that only by such careful studies may we ever hope to find out the methods of evolution; we can never solve the problem by inspection. TOWER holds that all organic variations are responses to stimuli; "the most logical interpretation is that this variation is a response of the germ plasm . . . . due to stimuli which produce an inheritable variation differing in no respect in its transmissibility and permanency from the other variations produced." "Variation is . . . . epigenetic and not a predetermined character in organisms." Another important conclusion is that there is no fundamental distinction between fluctuating variations and mutations. TOWER secured as good illustrations of mutation in Leptinotarsa as have been obtained in Oenothera, or better, but no hard and fast lines were to be seen separating these from ordinary variations. The "mutations" differed in that the variations exhibited greater jumps, but they did not differ qualitatively. The experiments fail to support the doctrine of unit characters. In Leptinotarsa also the mutations are orthoge-

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[2] TOWER, W. L., An investigation of evolution in chrysomelid beetles of the genus Leptinotarsa. Carnegie Institution of Washington, Publ. no. 48. pp. 320. Washington. 1906.